REMARKS

Claims 1-7 are pending and rejected in this application.

Claims 1, 3, and 4 are amended hereby. Support for such amendments can be found, e.g., in Figs. 1, 2, and 5 of the present specification.

In the Advisory Action dated November 21, 2003, the Examiner indicated that he was unable to enter the Supplemental Response which was filed on October 8, 2003, and that the proposed amendment would not be entered as it raises new issues.

Further telephone conferences were held with the Examiner on October 30, 2003 and November 20, 2003, in an attempt to arrive at acceptable claim language for claims 1, 3, and 4, in order to gain the allowance of claims 1-7. The proposed set of amendments submitted via facsimile to the Examiner on November 19, 2003, have been incorporated herein.

These changes are designed to both overcome the applied reference and increase the clarity and readability of the claims. The changes were only briefly discussed with the Examiner in the conversation of November 20, 2003. However, the Examiner acknowledged that a brief review of the proposed changes had been given and that he was generally pleased with the changes. The Examiner did state that a Request for Continued Examination (RCE) including such changes would likely gain favorable consideration.

The Examiner is again thanked for the courtesy he has extended in the various conversations that have occurred with respect to this case.

Kawakami et al. illustrates, as per Fig. 1 (c), a 3D periodic structure that is comprised of alternating layers of SiO_2 and Si, each layer having a repeating hexagonal (i.e., honeycomb structure) associated therewith. Giving such a hexagonal structure, it is clearly seen that there are intersecting projections and that not all of projections and/or groove regions can be considered to be co-directed. Furthermore, while not specifically shown by Kawakami et al., it is inherent that a similarly shaped hexagonal structure would be needed for a substrate in order to create the repeating hexagonal structure seen in Fig. 1 (c). Accordingly, Kawakami et al. fails to teach or suggest the present invention as set forth in any of Claims 1, 3, and 4, each as amended.

Furthermore, Claim 1, as amended, recites in part:

> the lamination along the z-axis repeating the shape and being configured for acting against the light such that the light thereby has a component whose angular incidence direction is not zero from the z-axis . . . associated with the polarizer.

Applicant further submits that such an invention is neither taught, disclosed, nor suggested by Kawakami et al or any of the other cited references, alone or in combination.

As seen from Fig. 1 (c) of Kawakami et al, both the groove or valley portions and the upper face on the projecting hexagonal portions are aligned so as to be perpendicular to the z-axis. Thus, any light incident upon either such valley faces or projecting faces will have an angular component that is zero relative to the z-axis. As

Responsive to the rejection of claims 1-7 under 35 USC § 112, second paragraph, Applicants have amended claims 1, 3, and 4 keeping in mind the comments offered by the Examiner. Applicants submit that claims 1-7 are now in allowable form and hereby respectfully request that the rejection thereof based upon 35 USC § 112, second paragraph, be withdrawn.

Responsive to the rejection of claims 1-7 under 35 USC § 102 (b) as being anticipated by "Fabrication and Observation of 3D Photonic Crystals Composed of Si/SiO_2 with Sub-Micrometer Periods" (Kawakami et al), Applicants have amended claims 1, 3, and 4 and submit that claims 1-7 are now in condition for allowance.

Claim 1, as amended, recites in part:

> . . . the shape of each said layer being in a form of an undulated structure, said undulated structure consisting of co-directed undulations, said undulated structure being a regularly or non-regularly undulated structure . . .

In a similar manner, amended claims 3 and 4 recite in part:

> laminating on a substrate a first refractive medium layer . . . and a second refractive medium layer . . . , said substrate having most one of each of a single set of regularly arranged, co-directed grooves, a single set of regularly arranged, co-directed projections, a single set of non-intersecting projections, and a single set of co-directed non-intersecting grooves.

Applicants submit that such an invention as set forth in amended Claims 1, 3, and/or 4 is neither taught, disclosed, nor suggested by Kawakami et al or any of the other cited references, alone or in combination.

such, Kawakami et al. fails to teach or suggest the present invention as set forth in Claim 1, as amended.

For all the foregoing reasons, applicants submit that Claims 1, 3, and 4, and those claims depending therefrom, are now in condition for allowance and hereby respectfully request that the rejection thereof based upon Kawakami et al. be withdrawn.

If the Examiner has any questions or comments that would speed prosecution of this case, the Examiner is invited to call the undersigned at 260/485-6001.

Respectfully submitted,

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JTK/tec10

Encs: Amendments to the Claims
(3 Sheets; pp. 6-8)
Explanatory Cover Sheet Page
Request for Continued Examination
(RCE) Transmittal
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AMENDMENTS TO THE CLAIMS

1. (currently amended) A polarizer comprising:

a multilayered structure along a z-axis two or more transparent layers, at least two said layers having different refractive indicies relative to one another,

each said layer having a shape, each said layer being a unit of lamination, the shape of each said layer being in a form of an undulated structure, said undulated structure consisting of a set of co-directed undulations, said undulated structure being ~~at least one of having a regularly undulated structure parallel to a first plane; being uniform parallel to a second plane, said second plane being orthogonal to said first plane; and having~~ a regularly or non-regularly undulated structure ~~which has a larger pitch than parallel to said first plane~~,

the lamination along the z-axis repeating the shape and being configured for acting against the light such that the light thereby has a component whose angular incidence direction is not zero from the z-axis in the three-dimensional orthogonal coordinates (x, y, z) associated with the polarizer.

2. (previously presented) A polarizer according to claim 1, wherein the polarizer has a first refractive medium layer containing at least one of Si and TiO_2 as a main component and a second refractive medium layer containing SiO_2 as a main component.

AMENDMENTS TO THE CLAIMS

3. (currently amended) A method for producing a polarizer comprising the steps of:

laminating on a substrate a first refractive medium layer and a second refractive medium layer with a regularly repeating shape, said laminating performed by a film-forming method at least partly including a step of dry etching said first refractive medium layer and said second refractive medium layer, said substrate ~~a substrate upon which said laminating is to occur, said etching of said substrate producing~~ having at ~~least~~ most one of each of a single set of regularly arranged, ~~coextending~~ co-directed grooves, a single set of regularly arranged, ~~coextending~~ co-directed projections, a single set of ~~thin and long~~ non-intersecting projections, and a single set of ~~thin and long~~ co-directed, non-intersecting grooves.

4. (currently amended) A method of producing a polarizer, comprising the steps of:

laminating on a substrate a first refractive medium layer which contains at least one of Si and TiO_2 as a main component and a second refractive medium layer which contains SiO_2 as a main component with a regularly repeating shape, said laminating performed by a film-forming method at least partly including a step of dry etching said first refractive medium layer and said second refractive medium layer, said substrate ~~a substrate upon which said laminating is to occur, said etching of said substrate producing~~ having at ~~least~~ most one of each of a single set of regularly arranged, ~~coextending~~ co-directed grooves, a single set of regularly arranged, ~~coextending~~ co-

AMENDMENTS TO THE CLAIMS

directed projections, a single set of ~~thin and long~~ non-intersecting projections, and a single set of ~~thin and long~~ co-directed non-intersecting grooves.

5. (previously presented) A polarizer according to claim 1, wherein the shape of layers at least one of has a regularly undulated structure along the x-axis and is uniform along a y-axis.

6. (previously presented) A polarizer according to claim 1, wherein said first refractive medium layer has a first index of refraction, said second refractive medium layer has a second index of refraction, said first index of refraction being greater than said second index of refraction.

7. (previously presented) A method for producing a polarizer according to claim 3, wherein said substrate has at least one of said thin and long projections and said thin and long grooves.